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That I am knowledgeable in the German language in which the below identified international application was filed, and that, to the best of my knowledge and belief, the English translation of the international application No. PCT/EP03/03810 is a true and complete translation of the above identified international application as filed.

I hereby declare that all the statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application issued thereon.

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Description

Device for storing bags

[0001] The invention is based on a device with the aid of which bags can be stored or stored on an interim basis, to be precise in such a manner that they can then be processed by a packaging machine.

[0002] DE 195 05 277 A1 has already disclosed a device for the interim storage of flat objects, the latter, for example sections of tubing, being wound up in stacks. The stacks are spaced apart from one another.

[0003] DE 196 27 158 A1 also discloses such a device, in the case of which stacks of bags are wound up in an imbricated manner.

[0004] The object of the invention is to make it possible to store bags for packaging machines in such a way that, instead of individual bags, stacks of bags are introduced into the packaging machine, it being possible to change, if appropriate, the size of the bags.

[0005] In order to achieve this object, the invention proposes a device having the features mentioned in claim 1 and/or a method having the features of claim 8.

[0006] Whereas, in the case of the known devices, the orientation of the individual bags is irrelevant, it is important for the present invention that the bags are oriented in stacks such that, as the roll is unwound, the opening side is oriented forward. At this point, the stacks of bags can be gripped by a gripping means and introduced into a feed means for the packaging machine. Packaging machines for which the device is intended required entire stacks of bags which all have to be arranged in a certain orientation.

[0007] For particularly high-speed packaging machines, which may also have a number of lines of bags, it may be provided, in a development of the invention, that the bags are arranged in an imbricated manner. The imbrication here is selected such that the abovementioned gripping means has sufficient space at the respective front bag stack in order to be able to grip the latter securely. It is possible to have arrangements for ensuring that, as the front bag stack is removed, the respectively following stack of bags does not slip or is carried along in part.

[0008] The bag stacks may be imbricated such that the leading edge of a bag stack is located beneath the trailing edge of the front bag stack or above the trailing edge of the front bag stack, as seen in the unwinding direction. In both cases, it can be ensured that, in the case of the respectively foremost bag stack, the leading edge and its adjoining region are free, with the result that the gripping means can readily act thereon. This is all the more important if, during the unwinding operation, the film forming the part of the roll is guided away over an unrolling roller, with the result that the front bag stack projects beyond this unrolling roller.

[0009] The device can be used, in particular, for processing bags which, in their opening region, have a tab with holes. Such bags can then be positioned as stacks, by the gripping means, on a feed means which has pins corresponding to the holes. The bags are thus arranged in a precise position on this feed means and can be fed without slippage to the further packaging machine.

[0010] The method proposed by the invention consists in combining the bags to form stacks in such a manner that

the opening sides of the bags are always in one place. The bags are then wound up onto a winding-up roller to form a roll with the aid of a single film or of two films located one above the other. It is possible here for the bags to be arranged in an imbricated manner. This roll then forms the store for the interim storage of the bag stacks. The roll can be transported, the bags being accommodated in a space-saving manner.

[0011] Further features, details and advantages of the invention can be gathered from the following description of a preferred embodiment of the invention, from the patent claims and from the abstract, which is worded in relation to the contents of the description, and with reference to the drawing, in which:

figure 1
shows a vastly simplified illustration of the device according to the invention in a first stage;

figure 2
shows the view of the leading edge during a later stage;

figure 3
shows the state in which the first bag stack is being removed;

figure 4
shows a further stage; and

figure 5
shows the state where the bag stack has been transferred to the feed means of a packaging machine.

[0012] Figure 1 illustrates, schematically, a device in which a roll 2 has been wound up on a winding-up roller 1. The roll 2 is formed by a band-like film 3 with

stacks of bags located thereon having been wound up onto the core. This winding-up operation is known per se. During the winding-up operation, the bags are oriented such that their openings are arranged on the trailing side, as seen in the winding-up direction, with the result that the openings are located on the leading side 4 during the unwinding operation. The bags are combined to form stacks, figure 1 showing only a single bag stack 5. The stacks of bags have to be aligned, with the result that they form a defined leading edge and trailing edge. During the unwinding operation, the film 3 is guided rectilinearly, preferably horizontally, in a first instance and is then guided over a deflecting roller 6 such that an acute angle is produced between the two sections of the film 3. This means that the bag stack 5 is conveyed on horizontally and rectilinearly in the forward direction at the location of the deflecting roller, that is to say it projects beyond the roller 6.

[0013] The device uses a gripping means 7 which, in simplified terms, contains a U-shaped profile with a securing means 8. The profile 9 is oriented such that the respectively front bag stack 5 is pushed into the profile 9. As soon as the bag stack 5 is arranged in the profile 9, see figure 2, the securing means 8 is actuated, with the result that the bag stack 5 is then secured in the profile 9. The gripping means 7 is then conveyed, with the aid of means which are not illustrated, to a feed means of a following packaging machine. This is illustrated schematically in figure 3. For each bag stack 5, the feed means contains, along a rail or a chain, two upwardly projecting pins 11 which are spaced apart from one another.

[0014] On their leading side, that is to say on the side where the opening is located, the bags contain a single-sided tab with two holes. The spacing of the

holes from one another corresponds to the spacing between the pins 11. The gripping means, then, is lowered from above in an aligned position, with the result that the pins 11 engage in the holes of the bags through incisions starting from the free side of the U-profile. Lowering the gripping means to the full extent results in the situation as is illustrated in figure 4. The securing means 8 is then released and the gripping means, with the profile 9, is drawn away to the side. The bags are then located as stacks on the feed means 10, from where they can be fed to the packaging machine in a direction perpendicular to the drawing plane.

[0015] The device proposed by the invention is suitable, in particular, for packing diapers or toilet rolls or, in general terms, for disposable hygiene articles.